B

ATTACHMENT

1. Cable modem service providers face substantial competition from other Internet access substitutes. Currently, the most notable of these substitutes is DSL service. There is unquestionably tremendous growth in DSL deployment and subscription, which has been largely driven by aggressive deployment efforts of incumbent LECs. Other broadband providers, *e.g.*, satellite and wireless-based broadband providers, are also beginning to emerge as other viable means of providing broadband Internet services to consumers. Finally, virtually all analysts estimate that narrowband providers will continue to compete vigorously with broadband providers for Internet access subscribers for the foreseeable future.

I. DSL IS A POTENT COMPETITIVE FORCE IN THE BROADBAND ARENA.

2. While cable modem services took an early lead in the race to provide high-speed access to the home, DSL deployment has exploded in the past two years. The prospect of full-fledged cable modem service has jolted incumbent LECs into aggressive deployment of their own advanced capabilities. As a result, DSL is now apparently available to more homes than cable modem service.[1]

3. Incumbent LECs are now spending billions of dollars to develop and deploy DSL products. ILECs themselves clearly believe that DSL is a potent competitive force today, and they reject the idea that cable has an insurmountable lead. For example, Verizon's President and CO-CEO, Ivan Seidenberg, recently dismissed the significance of cable's head start:

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[1] *See* David Kravets, *DSL Throttles Modems in IQ*, Cable World, at 8 (May 29, 2000); Lawrence J. Magid, *Small Business Tools/Software, Technology and New Products to Help Your Company The ABCs of DSL: Options Abound in Fast Internet Access Service*, L.A. TIMES, June 28, 2000, at C6.

> Well, cable modems are ahead now. Most estimates would suggest by the end of next year that there will be something like . . . 5 million cable modems and there are probably in the vicinity of 3 million DSL customers. What's happening now with the accelerated roll-out of companies like us, SBC, the analysts now project by the end of 2002 we'll have more DSL customers out there than the cable companies will have modems.[2]

BellSouth's CEO, Duane Ackerman, echoed Ivan Seidenberg's views:

> We are ramping up and scaling up our DSL marketing and provisioning. Last month's study by the Strategis Group established clear evidence that high-speed Internet users are demonstrating a growing preference for DSL over alternative options.[3]

4. In fact, the deployment of DSL services has continued to outpace the deployment of cable modem services.[4] Industry studies show that DSL sales are "expected to grow at a robust 48% during the fourth quarter alone, dwarfing the 5% growth rate of cable modems."[5] Some industry observers, including Morgan Stanley analyst Mary Meeker, predict that DSL subscribership will overtake cable modem subscribership as early as next year.[6] Other analysts believe that DSL sales will overtake cable modem sales within

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[2] National Press Club Luncheon Speech by Ivan Seidenberg, President and CO-CEO, Verizon Communication (September 25, 2000).

[3] Ackerman Remarks, at 7.

[4] For instance, the most recent (Nov. 2000) online census found that the number of DSL subscribers increased by 341.58 percent in the third quarter of 2000 (July – Sept.), whereas the number of cable modem subscribers increased by only 26.60 percent during the same time period. *See TR's Online Census: Reality Hits: Free ISPs Report 'Active' Users To Tone Down 'Subscribership,' DSL Begins In Earnest,* at 1 (Nov. 2000).

[5] *See* Cable v. DSL Article, at 54 (citing a study by Cahners In-Stat of Scottsdale, Ariz.).

[6] Morgan Stanley Dean Witter, *The Global Internet Primer*, at 23 (June 2000) ("Morgan Stanley Internet Primer"); *see also* Corey Grice, *DSL Could Pull Ahead in High-Speed Race, at* http://news. cnet.com/news/0-1004-200-1561720.html (March 1, 2000) (citing Cahners In-Stat Group).

a few years.[7] The Chairman of SBC, Ed Whitacre, claims that "[w]here cable and DSL compete in our markets, DSL wins."[8]

5. As the following table demonstrates, a recent report by Morgan Stanley anticipates spectacular DSL growth for the foreseeable future:[9]

Date	DSL lines in U.S.
2000*	2,344,000
2001 (year end)*	6,653,000
2002 (year end)*	11,563,000
2003 (year end)*	16,242,000
2004 (year end)*	20,863,000
2005 (year end)*	25,433,000

* Projected

6. The large incumbent LECs are responsible for the bulk of this growth.[10] Based on their own data, these incumbent LECs project that their DSL lines in service will increase by 367%, to approximately 1,850,000 lines by the end of 2000, compared to 396,000 lines at the end of 1999.

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[7] Both IDC and Insight Research predict that DSL will overtake cable by 2003. *See* David Lake, *Bandwidth Bandwagon*, Industry Standard, *at* http://www.thestandard.com/research/metrics/display/0,2799,15018,00.html (May 15, 2000).

[8] *RBOC Chiefs Stress Data Growth Potential, Wireless, DSL*, Communications Daily at 7-8 (March 10, 2000).

[9] *See* Morgan Stanley Internet Primer, at 23.

[10] As of the end of the third quarter, TeleChoice reported that incumbent LECs captured approximately 90 percent of all residential DSL line in service. *See TeleChoice DSL Deployment Summary, at* http://www.xdsl.com/content/resources/deployment_info.asp (Nov. 13, 2000). Based on a comparison of the Morgan Stanley projections and incumbent LEC estimates for year end 2000, these four incumbent LECs currently serve approximately 80 percent of all DSL customers (comparing incumbent LEC DSL estimates (1,850,000) with Morgan Stanley's projections total US DSL subscribership (2,344,000)).

ILEC DSL STATISTICS			
	12/31/99	12/31/00*	GROWTH %
SBC	169,000	900,000[11]	433%
VERIZON[12]	87,000	500,000	475%
QWEST[13]	110,000	250,000	127%
BELLSOUTH	30,000	200,000	566%
TOTAL	396,000	1,850,000	367%

Source - Company Reports and Press Releases--unless otherwise indicated (* Projected)

7. All of these companies have launched major initiatives to accelerate their deployment of DSL services and it is clear from their words and actions that DSL is a major component of their forward-looking business plans.[14] For example, SBC has invested $6 billion to bring DSL deployment to nearly all consumers located in its footprint to "transform the company over the next three years into the largest single provider of advanced broadband

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[11] Daniel Reingold of Credit Suisse First Boston, and Blake Bath of Lehman Bros. Inc. "estimate that SBC will end 2000 with about 900,000" DSL subscribers. *See* Reinhardt Krause, *Street Expects Mixed Bag as Telecom Firms Report*, Investor's Business Daily, Oct. 13, 2000, at 4. SBC maintains, however, that "it has the potential to achieve 1 million DSL lines in service by year-end 2000." SBC Communications, Inc., *Strong Data, Wireless and Long-Distance Operations Highlight SBC's Third-Quarter Results*, Investor Briefing at 4 (Oct. 23, 2000) ("*SBC Investor Briefing*").

[12] Verizon numbers include Bell Atlantic and GTE DSL subscribers.

[13] Qwest numbers include US WEST DSL subscribers.

[14] *See, e.g.*, Ackerman Remarks, at 4 ("[w]e have the most robust local network in the U.S., if not the world. Through prudent and consistent levels of investment, we are leveraging this asset by systematically transforming the network to digital broadband and IP. This targeted capital program has put 96 percent of our customers within 12,000 feet of fiber in our top 30 markets"); *SBC Investor Briefing*, at 4 ("SBC continues to make solid progress in developing next-generation broadband networks," because "[d]emand for DSL continues to be very robust"); *Verizon 3Q Results* ("[w]ith 3,500 DSL installations a day, we're on track to meet our year-end target of 500,000 DSL customers" (quoting Verizon Chairman and co-CEO, Charles R. Lee). "With the premier set of local wireline ... assets in the industry, we have the right platform -- a fiber-rich, data-centric network architecture -- on which to build a truly integrated bundle of broadband communications services" (quoting Verizon President and co-CEO, Ivan Seidenberg)).

services in America."[15] SBC's third quarter profit of 2000 rose sharply, driven by a 46 percent increase in revenue from its data business.[16] SBC executives estimate that the company will reach its target of one million DSL customers during the first quarter of next year[17] and report that SBC is currently signing up 6,000 to 7,000 DSL customers a day.[18] In fact, some analysts expect SBC to become America's largest single broadband provider within the next three years.[19]

8. Like SBC, Verizon is also aggressively deploying DSL service throughout its region. Its Chairman and co-CEO, Charles R. Lee recently confirmed Verizon's commitment to DSL, noting that Verizon has "moved quickly in the quarter to integrate the leadership and operations of our new enterprise, and we are now one team working to meet the increasing demands in all our markets for high-growth communications services. With 3,500 DSL installations a day, we're on track to meet our year-end target of 500,000 DSL customers."[20] To date, Verizon reports that it has equipped approximately 1,770 central offices for DSL and nearly 60 percent of its access lines already qualified for the service.[21] Verizon has also standardized its entry-level price for residential DSL at

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[15] *Project Pronto Press Release*; *see also Here's How: Universal Broadband Internet Service is Practical and Affordable. Every Telco, Not Just SBC Should Offer It,* ISP-Planet *at* http://www.isp-planet.com/technology/prime_service_ 092000.html (Sept. 20, 2000); *SBC to Offer DSL Through Neighborhood Gateways – FCC Order Will Make High-Speed Internet Service Available to Millions of Additional Consumers, at* http://www.sbc.com/News_Center/1,3950,31,00.html?query=20000908-1 (Sept. 8, 2000) ("*SBC 9/8 Press Release*").

[16] *See* SBC Communications, Inc., *SBC Reports Third-Quarter Earnings, at* http://www.sbc.com/ News_Center/1,3950,31,00.html?query=20001023-1 (October 23-, 2000).

[17] *See SBC Investor Briefing*, at 4.

[18] Ian Simpson, *SBC Profit Falls, Still Beats Street, at* http://dailynews.yahoo.com/h/nm/20001023/bs/sbc_earns_dc_5.html (October 23, 2000).

[19] *See SBC 9/8 Press Release.*

[20] *Verizon 10/30 Press Release.*

[21] *Id.*

$39.95 a month and has waived start-up connection and equipment charges. Verizon also reports that over 90 percent of its 3,500 daily installations are self-installed.[22]

9. BellSouth, which has traditionally lagged behind other BOCs in terms of DSL deployment, has also demonstrated significant growth in DSL subscribership in the near term. In the third quarter of this year, BellSouth added 60,000 DSL subscribers, an 81 percent increase from the previous quarter, and expects to meet its year-end target of 200,000 DSL customers.[23]

10. Finally, Qwest's chairman and CEO, Joseph Nacchio, has made it clear that Qwest has made a significant investment in DSL technologies and is "repositioned for growth next year in Internet hosting, wireless and DSL."[24] Through September 30, 2000, Qwest had 213,000 DSL subscribers, an increase of more than 166 percent over the same period in 1999.[25]

11. In light of these developments, DSL deployment by the incumbent LECs is far exceeding expert predictions and, consequently, forecasters have been dramatically revising upwards their projections of DSL penetration.[26]

12. Competitive local exchange carriers (CLECs) also provide broadband DSL service to business and residential customers.[27] The largest data CLEC, Covad, recently announced

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[22] *Id.*

[23] *See BellSouth Third Quarter ESP Increase 10%, at* http://www.bellsouthcorp.com/proactive/documents/render/ 34282.vtml (Oct. 19, 2000).

[24] *Qwest 3Q Results.*

[25] *See Qwest Communications Reports Strong Third Quarter Financial Results While Successfully Integrating $77 Million Company, at* http://www.qwest.com/about/media/story.asp?id=336 (October 24, 2000).

[26] *See, e.g.*, Morgan Stanley Dean Witter, *Telecom-Wireline: "DSL . . . It's Going Well,* (November 7, 2000) ("Morgan Stanley DSL Report").

[27] *See First Report* ¶ 41.

that it had 200,000 DSL subscribers at the end of September.[28] The next largest data CLEC, NorthPoint, reported that it had 87,300 DSL subscribers as of September 31, 2000.[29] The third largest data CLEC, Rhythms Netconnections, serves 47,000 DSL subscribers and estimates that it will have 2,150 collocation arrangements in place by year-end.[30] Together, NorthPoint, Covad, and Rhythms Netconnections accounted for roughly 90% of all competitive DSL lines in service at the end of 1999.[31]

13. As the foregoing demonstrates, DSL is *already* a competitive force, with the incumbent LECs currently capturing 235,000 customers per month,[32] and will become an even more potent force during the next two to three years as it becomes ever more widely available. If AT&T and other cable companies do not provide attractive, competitive services, they risk losing many millions of customers to DSL and possibly also to the emerging satellite and wireless broadband technologies.

II. OTHER BROADBAND TECHNOLOGIES WILL SOON BECOME COMPETITIVE FORCES.

14. Satellite-based technologies are rapidly emerging as a viable means of providing broadband Internet services to consumers. According to the Commission's *Second Report,* projected subscription rates by 2004 vary from 1.2 to 4.6 million.[33] Some analysts predict that satellite high-speed systems may capture between 5 and 10 percent

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[28] *See Covad Beats Q3 Line Expectations; More Than 200,000 Lines in Service at End of Third Quarter, at* http://news.excite.ca/news/bw/001003/ca-covad-communications (Oct. 3, 2000).

[29] *See NorthPoint Reports Third Quarter Line Count Growth of 41% to 87,300, at* http://www.northpoint.net/about_press.asp?PressReleaseID=1169 (Oct. 26, 2000).

[30] *See* Andrew Backover, *Getting a Line on the 'Net,* DENVER POST, at E-01 (Aug. 14, 2000); *On My Own and Loving It, Says Rhythms Communications Today* (Sept. 15, 2000).

[31] Association for Local Telecommunications Services (ALTS), *The State of Competition in the U.S. Local Telecommunications Marketplace* (February 2000) at Graphic N.

[32] *See* Morgan Stanley DSL Report.

[33] *Second Report* ¶ 202.

of high-speed access subscribers.[34] Other projections indicate that satellite subscriptions will increase 159 percent by 2004.[35]

15. Several companies are already offering satellite-based high-speed Internet service. For example, DirecPC, a product of Hughes Network Systems (Hughes), offers consumers nationwide access to the Internet at downstream speeds of up to 400 kbps (with a telephone return path).[36] Echostar also offers consumers a similar high-speed Internet service.[37]

16. StarBand, a joint venture of Microsoft Corp., EchoStar Communications Corp., Gilat Satellite Networks Ltd. and ING Furman Selz Investments, is in the process of launching its two-way high-speed satellite-based Internet service throughout the country. According to a recent article, "[t]he joint venture plans to introduce the service through Echostar's DISH Network, with its more than 4 million subscribers and network of some 23,000 retailers. Microsoft will provide Internet access and retail distribution through approximately 7,200 RadioShack stores. In addition, Microsoft will provide a Microsoft/Gilat-To-Home co-branded Internet portal."[38]

17. A number of other providers have announced aggressive plans to deploy two-way satellite broadband Internet service in the near future. For example, Hughes plans to

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[34] *Id.*

[35] See Gartner Group, Inc., *The Residential Broadband Revolution: Finally,* at 9, Table 2 (August 14, 2000) ("Residential Broadband Revolution").

[36] *See, e.g., DirecPC Is Fast, at* http://www.direcpc.com/consumer/what/what.html ; Hold the Phone <http://www.teledotcom.com/directlink.cgi?TLC2000030650027> (visited Nov. 30, 2000).

[37] *See EchoStar Communications Corporation and Geocast Network Systems Align to Deliver New Personalized Interactive Broadband Services to PC Users Via Satellite, at* http://www.electronichouse.com/news101600echostar.html (Oct. 16, 2000).

[38] *Gilat-To-Home Leases 14 Ku-band Transponders On Loral Skynet Telstar 7,* Satellite Today (Sep. 5, 2000).

initiate its own two-way (Ku-band) broadband Internet service via the DirecPC satellite network, which will feature "AOL Plus" broadband content and "offer links to DirecTV's standard DBS video package" by the end of this year.[39] Hughes also has invested $1.4 billion in a two-way broadband data satellite network, Spaceway, which will provide consumers in North America with broadband Internet service beginning in 2003. A variety of other satellite providers, including iSky,[40] Skybridge,[41] and AstroLink project deployment of systems capable of providing residential and business advanced services over the next several years.[42]

18. Another emerging broadband access technology is fixed wireless. Analyst projections for fixed wireless high-speed services suggest penetration levels of between 12 and 15 percent of all projected residential high-speed consumers by 2004. Capital expenditures by MDS providers are expected to increase significantly in the next few years, as two-way fixed wireless services are currently in the early states of deployment.[43] Capital expenditures by LMDS providers have increased significantly in the past few years and are expected to increase further over the next few years.[44] As a result, it is predicted that

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[39] "AOL-Plus" is already available nationwide via the existing one-way satellite Internet service. *Hughes Network Systems Announces Launch of AOL Plus Powered by DirecPC*, Hughes Network Systems Press release (October 25, 2000) <http://www.hns.com/news/pressrel/csp_pres/p102500.htm>

[40] Theresa Foley, *Broadband Via Satellite: Pipe Dreams?*, Via Satellite (May 10, 2000).

[41] Chris Bulloch, *Filling in the Gaps*, Telecommunications International Edition (September 2000).

[42] *See Second Report* ¶ 201, n.289.

[43] *Id.* ¶ 198. Two-way MDS service was authorized just two years ago, in September of 1998. *Id.*

[44] *Id.* ¶ 199.

the number of fixed wireless broadband data subscribers will increase anywhere between 95%[45] and 140%[46] by 2004.

19. In 1999 alone, WorldCom and Sprint spent over $2 billion to acquire ten MDS operators and intend to invest an additional $300-400 million to deploy high-speed fixed wireless services.[47] Sprint already provides wireless broadband Internet services to customers in Tucson and Phoenix, Arizona and has recently committed to expanding those services to an additional 45 markets across the United States covering 24.8 million households.[48] WorldCom is deploying fixed wireless facilities with comparable coverage.[49] In addition, Teligent has launched fixed wireless broadband data services in 40 U.S. markets, Winstar Communications has wireless networks running in 45 markets (and is targeting an additional 15 markets), and XO Communications (formerly Nextlink) has begun offering wireless Internet service in Los Angeles and Dallas and intends to have broadband services operational in 25 markets by year end.[50]

20. Finally, broadcasters are beginning to announce plans to deploy Internet access service. For instance, twelve broadcast groups have announced the formation of iBlast, a national network that will use a dedicated portion of the digital spectrum assigned to local

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[45] Mike Paxton, *Fixed Wireless Broadband: Still the Bridesmaid?*, Cahners In-Stat Group, at 48 (July 2000).

[46] *Fixed Wireless Broadband Poised for Explosive Growth*, Strategis Group (April 26, 2000) < http://www.strategisgroup.com/press/pubs/wwb.html>; *see also Residential Broadband Revolution* at 9, Table 2 (predicting fixed wireless subscribers will grow at an annual rate of 115.82 percent).

[47] *Second Report* ¶ 198 & nn.279, 280.

[48] *See Sprint Files For Two-Way MMDS Licenses in 45 Major Markets – Service Area Covers Nearly 25 Million Households, Plus Small Businesses*, Sprint Press Release (Aug. 22, 2000), at <http://www3.sprint.com/PR/CDA/PR_CDA_Press_Releases_Detail/1,1694,2004,00.html>.

[49] *See The Year of the Launch*, Wireless Week (June 5, 2000).

[50] *See id.*

television stations to deliver a wide array of high-speed, over-the-air broadband digital content and services directly to consumers in select markets in 2001.[51] Other companies, including, Geocast and WaveXpress, have announced plans to offer datacasting services through partnerships with over-the-air broadcasters within the next year.[52]

III. NARROWBAND PROVIDERS WILL CONTINUE TO COMPETE VIGOROUSLY WITH BROADBAND PROVIDERS FOR INTERNET ACCESS SUBSCRIBERS FOR THE FORESEEABLE FUTURE.

21. In addition to these broadband options, all of the narrowband methods through which customers currently access the Internet are still available. In fact, approximately 92 percent of U.S. households that use Internet access services do so over traditional phone lines in narrowband form.[53] A large majority of them will likely continue to do so for the foreseeable future. As the Cable Service Bureau pointed out: "Even the most optimistic estimates predict that narrowband will still be the dominant subscribed form of Internet access by 2005."[54] Some analysts have recently reconfirmed the Cable Service Bureau's prediction, estimating that approximately 36 percent of all online consumers will subscribe to a broadband Internet access service by 2005.[55]

22. It should be beyond dispute that broadband and narrowband providers will compete vigorously for the patronage of Internet subscribers for the foreseeable future. For AT&T and other cable companies to transform broadband Internet access into a mass market product, they must convince millions more dial-up users to switch. If broadband prices

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[51] Jim Davis, *TV Industry Getting Serious About "Datacasting," at* http://news.cnet.com/0-1006-200-1567193.html?tag=st.ne.1002 (March 8,, 2000). iBlast claims to have current agreements with broadcasters that will allow it to reach 80 percent of U.S. homes.

[52] Pete Wetmore, *A Blast of Digitized Air,* ZDNet Interactive Week (September 26, 2000).

[53] *See Second Report* ¶ 186.

[54] *Broadband Today,* at 32; *see also Second Report* ¶ 186.

[55] Jupiter Research Vision Report, *Consumer Broadband: Differentiate Beyond Technology to Drive Consumer Adoption* (2000) at 13.

are too high, or the quality of the broadband offering inadequate, fewer customers will convert from dial-up service. Thus, narrowband pricing will constrain broadband pricing for years to come. Consequently, at present, we conclude that broadband and narrowband Internet access are in the same relevant market.

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I declare under the penalty of perjury that the foregoing is true and correct.

Janusz A. Ordover

Dated: 11/30, 2000

New Canaan CT

I declare under the penalty of perjury that the foregoing is true and correct.

Robert D. Willig

Robert D. Willig

Dated: 11/30, 2000

"Flavors" of Digital Subscriber Line (DSL)

Acronym	Name	Data Rate	Mode	Applications
IDSL	ISDN DSL	128 kbps	Duplex	data only, dedicated Internet access, low speed videoconferencing
ADSL	Asymmetric DSL	1.5 to 9 Mbps 16 to 640 kbps	Down Up	Internet access, remote LAN access, interactive media
G. Lite	ADSL Lite	1.5 Mbps 90 kbps	Down Up	Same as ADSL at the low end, standard designed for plug and play PC modems
VDSL	Very high data rate DSL	13 to 52 Mbps 1.5 to 2.3 Mbps	Down Up	Same as ADSL plus HDTV and video on demand
HDSL	High data rate DSL	1.544 Mbps 2.048 Mbps	Duplex Duplex	T1/E1 service, WAN, LAN access, server access
SDSL	Single line / Symmetric DSL	1.544 Mbps 2.048 Mbps	Duplex Duplex	Same as HDSL plus access at customer premises for symmetric services

Sources: , MSDW "The Broadband Report, May 2000"

Example of "Fixed" Wireless Pro[illegible]

Company - Service	Deployment	Spectrum	Avail. Speed Up : Down
	40 operating markets YE99. Target: All 74 cities YE02. Major: NYC, LA, Chicago, DC	24 GHz (DEMS)	1.5M : 1.5M
	67 markets: 60 operational by YE00 Major: NYC, LA, Chicago, San Fran, DC	38 GHz and 28 GHz (LMDS)	45M : 45M
	128 licenses: 58 operating markets: 100 by 2001. Major: NYC, Boston, LA, DC	MMDS	310k : 310k 1.5M : 1.5M
	80 licenses: 50 operating markets. Major: Chicago, Denver, Las Vegas, Milwaukee, San Fran, Seattle	MMDS	2M : 2M
	Chicago, Dallas, Ft. Worth, Anchorage, Houston, San Diego, Los Angeles, 40 cities by YE02	PCS	1M : 1M
	82 licenses covering approximately 95% of the top U.S. markets. 25 cities by YE00.	LMDS	155M - pt. to pt. 10M – pt. to multipt.
	Two BTAs (Basic Trading Areas) of Wichita and Hutchinson, KS	LMDS	N / A
	30 licenses: 25 cities by 2002 thru out CO, WY, MT, ND, MN, WA, OR, UT	LMDS	10M : 10M
	(start operation 2002 – metropolitan areas)	lighter than air platforms	10M : 10M
	(100 cities by 2003)	HALO aiircraft	25M : 25M

Sample of Satellite Providers

Company	Investors	#of Sat.	Max Speed: Up : Down	1st Sat.
	Lockheed Martin, TRW, Telespazio, Liberty Media	9 GEO	20M : 920M	2001
	Motorola, Matra, Marconi	63 LEO, 9 GEO	51M : 51M	2003
	GE Americon	9 GEO	33k : 2M	in svc.
	Liberty Media, TV Guide, Kleiner Perkins	2 GEO	N/A	2001
		7 MEO	1.5M : 1.25G	2002
	Orion Network Systems	3 GEO	25M : 25G	in svc.
	Denali Telecom	13 GEO	155M : 144G	N/A
	Alcatel, Toshiba, Mitsubishi, Aerospace Canada	80 LEO	10M : 100M	2002
	Hughes Electronics	16 GEO, 20 MEO	6M : 108M shared	2002
	Craig McCaw, Bill Gates, Boeing	288 LEO, 24 spare	2M : 64M	2002
	Virtual GEO	15 GEO	N/A	2003

Source: NTIA & RUS, Advanced Telecommunications in Rural America, Appendix C